CLAIMS

What is claimed is:

1. A method for detecting a nucleic acid target, the method comprising:

a) providing a substrate comprising a surface, the surface comprising at least 100 nucleic acid probes, each nucleic acid probe contained in an area of less than about 0.1 cm^2, and each nucleic acid probe having a defined sequence and location on the surface;

b) contacting the surface with a nucleic acid target, comprising a target nucleic acid sequence, to permit the nucleic acid target to hybridize with at least one selected nucleic acid probe that comprises a probe nucleic acid sequence capable of hybridizing to the target nucleic acid sequence, and wherein the target comprises a binding ligand;

c) contacting the hybridized target with a receptor comprising one or more sites capable of binding the binding ligand to complex the receptor to the binding ligand, said receptor being complexed to a detectable microparticle;

d) detecting the presence of the microparticle.

2. The method of claim 1, wherein the binding ligand comprises biotin, the receptor comprises streptavidin, and the microparticle is fluorescent.

3. A method for detecting a nucleic acid target, the method comprising:

a) providing a substrate comprising a surface, the surface comprising at least 100 nucleic acid probes, each nucleic acid probe contained in an area of less than about 0.1 cm^2, and each nucleic acid probe having a defined sequence and location on the surface;

b) contacting the surface with a nucleic acid target, comprising a target nucleic acid sequence, to permit the nucleic acid target to hybridize with at least one selected nucleic acid probe that comprises a probe nucleic acid sequence capable of hybridizing to the target nucleic acid sequence, and wherein the target comprises a first binding ligand;

c) contacting the hybridized target with a first receptor capable of binding to said binding ligand;

d) complexing the first receptor with an anti-receptor, said anti-receptor being conjugated to a microparticle, said anti-receptor comprising a plurality of second binding ligands;

e) complexing said anti-receptor with a plurality of second receptors, each of said second receptors comprising a detectable moiety;

d) detecting the presence of the detectable moiety.

4. The method of claim 3 wherein the first receptor complexes with the anti-receptor via a direct receptor-anti-receptor interaction.

5. The method of claim 3 wherein the first receptor complexes with the anti-receptor via said second binding ligand.

6. The method of claim 3 wherein the anti-receptor complexes with the second receptor via a direct receptor-anti-receptor interaction.

7. The method of claim 3 wherein the anti-receptor of complexes with the second receptor via said second binding ligand.

8. The method of claim 3 wherein the first and second binding ligands are the same and said first and second receptors are the same.

9. The method of claim 3 wherein the microparticle is detectable.

10. The method of claim 9 wherein the microparticle is fluorescently dyed.

11. The method of claim 3 wherein the detectable moiety is phycoerythrin.

12. The method of claim 3 wherein the first receptor comprises a second detectable moiety.

13. The method of claim 12 wherein said first and second detectable moieties are detected using the same detection method.

14. The method of claim 12 wherein said microparticle, said first detectable moiety and said second detectable moiety are detected using the same detection method.

15. A complex comprising: a probe immobilized to a solid substrate; a target molecule hybridized to said probe, said target molecule comprising a binding ligand; and a receptor complexed to said binding ligand, said receptor being conjugated to a detectable microparticle.

16. The complex of claim 9 wherein said binding ligand is a biotin and said receptor is streptavidin.

17. The complex of claim 9 wherein said microparticle is fluorescently dyed.

18 ~~12.~~ A complex comprising: a probe immobilized to a solid substrate; a target molecule hybridized to said probe, said target molecule comprising a first binding ligand; a first receptor complexed to said first binding ligand; an anti-receptor complexed to said first receptor, said anti-receptor comprising a plurality of second binding ligands and being conjugated to a microparticle; and a second receptor complexed to said anti-receptor, wherein said second receptor comprises a detectable moiety.

19 ~~13.~~ The method of claim 12 wherein said anti-receptor is complexed to said first receptor via a direct anti-receptor-receptor interaction.

20
~~14.~~ The method of claim 12 wherein said anti-receptor is complexed to said first receptor via said second binding ligands.

21
~~15.~~ The method of claim 12 wherein said anti-receptor is complexed to said second receptor via a direct anti-receptor-receptor interaction.

22
~~16.~~ The method of claim 12 wherein said anti-receptor is complexed to said second receptor via said second binding ligands.

23. (new) A method for detecting a target, the method comprising:

providing a substrate including a surface containing a plurality of nucleic acid probes; hybridizing a target with at least one probe, said target having a binding ligand;

forming a detectable complex by contacting said hybridized target with a first complex including a first receptor for said binding ligand and a second complex including a detectable microparticle, a plurality of second receptors for said first receptor and a plurality of said binding ligands;

A1

removing unbound complexes; and

detecting the microparticle.

24. (new) The method of claim 23 wherein said binding ligands are biotin, said first receptor is streptavidin and said second receptor is a biotinylated anti-streptavidin antibody.

25. (new) The method of claim 23 wherein the first complex further comprises a detectable moiety and said detectable moiety is detected.

26. (new) The method of claim 25 wherein said detectable microparticle and said detectable moiety are differentially detectable.

27. (new) A method for detecting a target, the method comprising:

providing a substrate including a surface containing a plurality of nucleic acid probes;

hybridizing a target with at least one probe, said target having a first binding ligand; and

contacting said hybridized target with:

a first complex including a receptor for said first binding ligand and optionally a first detectable moiety;

a second complex including a detectable microparticle, a receptor for said first receptor complex and a second binding ligand; and

a third complex including a receptor for said second binding ligand and optionally a second detectable moiety;

A1

removing unbound complexes; and

detecting the presence of the microparticle.

28. (new) The method of claim 27 wherein said first detectable moiety is detected.

29. (new) The method of claim 28 wherein said microparticle and said first detectable moiety are differentially detectable.

30. (new) The method of claim 27 wherein said second detectable moiety is detected.

31. (new) The method of claim 30 wherein said microparticle and said second detectable moiety are differentially detectable.